Figure 10a - Input / output characteristics of logical relation classifier

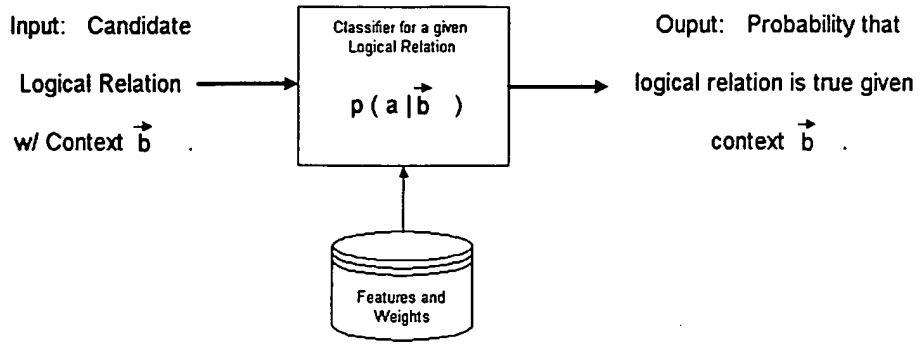

Figure 10b - Functional form of the probability distribution model.

Maximum Entropy Model used for parser / Semantic Interpreter

$$p(a|\vec{b}) = \frac{1}{Z(\vec{b})} \bullet \exp\left\{\sum_{1}^{n} \lambda_i f_i(a,\vec{b})\right\}$$

λ_i = weighting factor for feature i (Computed from training example statistics)

$Z(\vec{b})$ = normalization factor to assure that the probability is within the range 0.0 to 1.0

Figure 10c - Definition of a binary-valued feature function to support (i) positive evidence and (ii) negative evidence

(i) $$f(a,\vec{b}) = \begin{cases} 1 & if\ (a = 1) \& (b_2 = true \,\&\, b_6 = true \,\&\, b_8 = false) \\ 0 & otherwise \end{cases}$$

(ii) $$f(a,\vec{b}) = \begin{cases} 1 & if\ (a = 0) \& (b_2 = false \,\&\, b_7 = true \,\&\, b_8 = true) \\ 0 & otherwise \end{cases}$$